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The original reports of the officers of this expedition are lost to the world, perhaps forever, but THEOPHRASTUS had access to them, and has presented their observations on plants, together with his own. BRETZL, the author of the work, believes that THEOPHRASTUS deserves to rank among the great botanists of the world, and that he was the only great botanist of antiquity, so far as we have record. PLINY, in comparison, is regarded as an inaccurate copyist. It is certainly remarkable that at the very earliest dawn of botanical study so many correct observations should be made, observations, too, which have commonly been lost sight of even until now. Nearly all of the important observations made by THEOPHRASTUS have been reported as original by modern botanists.

A few of the more striking contributions made by the Greeks may be here mentioned. Mangrove swamps were reported about the Persian Gulf, and this record is the only one we have of them; they have not yet been "originally" reported by modern botanists; SCHIMPER says that, with the exception of Avicennia, mangroves have not been seen west of the Indus. The descriptions of the mangroves are so exact that one has no trouble in making out the character species as we now know them. The zonal relations of the species were noted, Rhizophora being correctly regarded as the pioneer. It was inexplicable to them, as it is to us still, that plants, and particularly trees, could grow in salt water. Similar geographic studies were made in the deserts of Beluchistan, and there, as in the mangrove swamps, the character plants were described as such. THEOPHRASTUS used a series of leaf types in his descriptions, based largely on ecological features; more than two thousand years later, HUMBOLDT made out a similar series, and largely because of this has been generally regarded as the father of plant geography. The nyctitropic movements of the tamarind leaf are carefully described and are definitely termed sleep movements, distinction being made between leaves of that type and those of Mimosa. The banyan is correctly regarded as a fig, and the supporting roots are called roots and not stems, because they are leafless, and not green; their adventitious character is also noted. Compound leaves are so regarded in spite of the leaf-like appearance of the leaflets; the reasons given are the fall of the entire structure in autumn, and the fact that in the buds the leaflets are not differentiated. The sexuality of plants is clearly shown, especially in cucurbits and dates, and use is made of the terms male and female. Nearly two thousand years later, CAMERARIUS again showed the sexuality of plants, although it was late in the century just past before it was universally accepted.—HENRY C. COWLES.

Biological statistics.

DAVENPORT'S *Statistical methods*[4] has been revised and enlarged and made to embody all the more important recent developments in the mathematical analysis of variation in living organisms, as elaborated chiefly by PEARSON and his students. Much of the book has been rewritten and many additions of new examples and new methods are given, making it more indispensable than ever as a handbook for the student of this important phase of biology.

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[4] DAVENPORT, C. B., Statistical methods with special reference to biological variation. 2d. ed. 16mo. pp. viii + 223. *figs. 10.* 1904. New York: John Wiley & Sons. For review of first edition see BOT. GAZ. **28**: 364. 1899.

The changes which have been made are too numerous to be considered in detail, but the most noticeable are as follows. (*a*) The section is omitted which dealt with the quantitatve expression of terms used by botanical taxonomists in the description of leaf-form. (*b*) The subject of correlation has received new and altogether better treatment by the substitution of YULES'S method for DUNCKER'S, and the addition of PEARSON'S method for determining the correlation between qualities not quantitatively measurable. (*c*) Two additional types of asymmetrical curves are presented. (*d*) A section is introduced dealing with MENDEL'S law of alternative inheritance. (*e*) A 22-page chapter on the results of statistical biological study is substituted for the 2-page chapter on the applications of statistical methods. (*f*) A professedly complete bibliography is given instead of a selected one.

A comparison of the bibliography with that given in the first edition shows in an interesting way the remarkable activity which has developed in this field. In the earlier edition thirty-nine titles were given, in the present edition there are 265 references, 186 of which bear dates later than the date of publication of the first edition. As is usual in extensive bibliographies the attempt at completeness leaves something to be desired. A number of titles not found in the list occur to the reviewer as being of more value statistically than some which are given.

The unique feature of the chapter on the results of statistical studies is a tabulated analysis of the literature, showing the general bearing, and in some instances the point of view, of each paper. At least two of these papers are listed under subjects to which they make no significant contribution; *e. g.*, HARSHBERGER on "The limits of variation in plants" and KELLERMAN on "Variation in *Syndesmon thalictroides*" are classed as dealing with correlation, but neither paper treats specifically of questions of correlation, and the data given by each are too meager to be of value to students who would be interested in turning them to account in the study of correlations.

Everyone will appreciate how difficult it must be to keep free from errors a work made up so largely of tabulations. A reference on p. 113 to Table X means Table X of the first edition, which has become Table XII of the present edition. Botanists will be astonished to see *Syndesmon thalictroides* classed as a desmid on p. 78.

On the whole, the second edition is a very marked advance over the first, and there is every reason to expect that with its assistance the bibliography of statistical biology will rapidly advance in the coming years, not alone in the number of titles but also in the clearness and completeness of mathematical analysis and in the importance of the conclusions reached.—GEORGE H. SHULL.